WHY BROADBAND MATTERS
IOWA COMMUNICATIONS NETWORK

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The Broadband Matters campaign is designed to show the importance and possibilities of broadband access in the areas of: education, healthcare, public safety, government services and economic development. Ensuring affordable, reliable broadband access to all parts of the state levels the playing field between urban and rural areas.

The Iowa Communications Network (ICN) is advocating for broadband with the launch of the statewide initiative 'Broadband Matters.' This campaign highlights the necessity of providing high-speed broadband access to all corners of the State. The purpose of the campaign is threefold:

1. To help educate the public on the availability of broadband services and technologies.
2. To help foster the understanding of the need for broadband and the role it plays in Iowa's future in a 21st century global marketplace.
3. To help propel the entire statewide broadband conversation; even beyond the reach of the ICN and its authorized customer base.

Iowa's Governor Terry Branstad and Lt. Governor Kim Reynolds have made it clear that broadband access for all Iowans is a top priority.

> *"As the Governor and Lt. Governor of Iowa, we believe in ensuring that every Iowan has an equal opportunity to access quality broadband technology. Connectivity is a great equalizer for our state. We also believe that every Iowan – students, small business owners, rural health care providers, and public safety officers – can benefit from quality access, adoption, and use of broadband technology.*
>
> *According to the non-profit subsidiary Connect Iowa, 76% of Iowa households are now subscribing to broadband service compared to the national broadband adoption rate of 70% as found by the Pew Research Center. While those numbers are optimistic, we believe there is plenty more to work on to make Iowa the most connected state in the Midwest. We know that for Iowa to continue to grow and prosper, we must have quality broadband technology across both the urban areas and just as importantly, the rural ones. We will continue to work to*

bring high-speed Internet access to all corners of the state, not just to population and industrial centers."

> *We know that for Iowa to continue to grow and prosper, we must have quality broadband technology across both the urban areas and just as importantly, the rural ones.*

Through this Broadband Matters campaign, the Iowa Communications Network intends to generate and encourage a statewide conversation about the ways in which public and private partnerships can be established to spur the development of high-speed broadband throughout the State of Iowa. High-speed broadband is not an urban issue or a rural issue. Access to affordable and reliable broadband is an issue for all Iowans. A statewide conversation will underscore the importance of broadband in a 21st century economy in a global community. Every Iowan is a stakeholder in this collaboration; therefore, it will take a shared effort to reach the goal of connecting every Iowan to high-speed broadband access.

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Broadband Reference Guide: A Resource for Digital Stakeholders

The following broadband information is directly from the *Broadband Reference Guide: A Resource for Digital Stakeholders* produced by the WI Public Service Commission, UW-Extension Madison, and the Center for Community Technology Solutions. The purpose of the guide was twofold: first, to answer some of the basic questions about broadband and to provide readers with the knowledge and tools to understand broadband services and technologies; second, to help readers learn why broadband is necessary in the 21st century, what it means for business and public institutions, and how it benefits our communities and its citizens from Pre-K to gray. To view the reference guide visit www.link.wisconsin.gov/lwi/docs/Broadband%20Reference%20Guide_Final_2014.pdf.

The ICN would like to thank the WI Public Service Commission, UW-Extension Madison, and the Center for Technology Solutions for allowing us to use this information in this document.

"**What is Broadband?** [1]

Broadband connects people to the Internet. It is a high-speed transmission link from a home, business or school to the World-Wide Web and other digital resources. It replaces a traditional "dial-up" or narrow band telephone connection since it is always on and allows you to use multiple services at the same time. For example, you don't need to disconnect from the Internet to make a telephone call.

Broadband is available for different technologies (laptops, mobile phones, tablets) and from many different Internet Service Providers (ISPs). With compatible equipment, broadband connections allow a user to support many different devices at once. You can access the Internet (i.e., surf the world-wide-web, listen to music, check your email, visit social media sites, etc.), watch TV, and use your telephone. Often these services (Internet, phone, and TV) are packaged together or bundled so one provider (one bill) offers all these options to meet your household or small business needs. Broadband service providers can be telephone or cable companies, a wireless network provider (cell phone companies) or satellite service.

Broadband infrastructure consists of the backbone, the middle mile, and the last mile.

What are the Different Types of Broadband Technologies? [1]

Many different types of broadband technologies are available and the speeds for these technologies vary; not all broadband technologies are available in every location. Internet Service Providers (ISPs) determine the type of broadband technology they can provide and the locations they serve.

[1] *Source: Information from Wisconsin's Broadband Reference Guide produced by: WI Public Service Commission, UW-Extension Madison, and the Center for Community Technology Solutions, January 2014*

ISPs usually advertise broadband by download speeds, or as a download speed "up to" so many megabits per second (mbps); therefore, understanding the actual technology when purchasing broadband can be difficult, and may not be as important as the broadband speed. However, some basic knowledge of the different broadband technologies, and the pros and cons for each, is important when comparing plan features and investing in a broadband service plan. Broadband technologies can be divided into two categories, wired broadband and wireless technologies.

How Much Data Does a Person Need? [1]

The amount of data and bandwidth needed depends on two main factors: how many users or devices require connection at the same time and the function each device or user is performing. The Federal Communications Commission (FCC) provides households with some basic bandwidth guidelines when multiple devices are utilizing the same connection. The FCC Bandwidth Guidelines Table lists the guidelines produced by the FCC (http://www.fcc.gov/guides/household-broadband-guide).

This is a matrix that contains upload and download speeds that are needed for different online tasks. This matrix provides additional detail and will determine bandwidth needs for different applications."

FCC Bandwidth Guidelines Table

Number of Users Laptop, Tablet, or Game Console	Light Use Basic functions: email, web surfing, basic streaming video	Moderate Use Basic functions plus ONE high demand application running at the same time (streaming HD, video conference, or online game)	High Use Basic functions plus MORE THAN ONE high demand application running at the same time
1 user on 1 device	1 to 2 mbps	1 to 2 mbps	6 to 15 mbps
2 users or devices at a time	1 to 2 mbps	1 to 2 mbps	6 to 15 mbps
3 users or devices at a time	1 to 2 mbps	1 to 2 mbps / 6 to 15 mbps	more than 15 mbps
4 users or devices at a time	1 to 2 mbps / 6 to 15 mbps	6 to 15 mbps	more than 15 mbps

Basic Service = 1 to 2 mbps*
Medium Service = 6 to 15 mbps
Advanced Service = More than 15 mbps
*mbps (megabits per second) is the standard measure of broadband speed. It refers to the speed with which information packets are downloaded from, or uploaded to, the Internet

Source: Information from Wisconsin's Broadband Reference Guide produced by: WI Public Service Commission, UW-Extension Madison, and the Center for Community Technology Solutions, January 2014

EDUCATION

Broadband is changing the education landscape in Iowa. Broadband Matters is dedicated to providing awareness of the critical need to connect every student with high-speed Internet access using laptops and mobile devices to ensure every student receives a 21st century education. With broadband availability, a culture is created in which learning becomes more interactive in and outside of the classroom allowing for a more positive collaborative learning experience.

For educators, broadband encourages a curriculum without boundaries. Iowa has an aggressive one-to-one computing movement where schools are encouraged to make mobile computing devices available to each and every student.

> Gregg Cruickshank, Superintendent of Sidney CSD and South Page CSD says, *"We're almost to the point where we have created a virtual high school so to speak, and technology is a key component. Broadband access is critical to that."*

High-speed Internet benefits students regardless of their socioeconomic, cultural and ethnic diversities throughout our state with the goal of ensuring all students have the same access to information in our global society. ICN's broadband initiative includes advocating for Iowa's rural and urban students, so there are no haves and have-nots, and all students can receive the same access to the Internet both at school and at home.

> John Carver, Superintendent of Howard-Winneshiek CSD explains, *"Right now today, broadband is a determining factor in instruction. A child's education in Iowa isn't limited by where they are physically; it's limited by broadband access."*

PUBLIC SAFETY

Broadband infrastructure matters to public safety as a faster, more coordinated response to incidents will provide quicker access to those in need. Local events such as fires, regional incidents like tornadoes and floods, and national incidents like pandemic illnesses can severely disrupt normal day-to-day operations. With these event disruptions, broadband connections can save lives or limit the risk of injury to those affected by an emergency situation.

The general public benefits from broadband from a public safety standpoint as it relates to providing live feeds using the Iowa Department of Transportations' traffic cameras, weather alert systems, and Interstate billboard messages. Broadband gives all residents the ability to become first reporters. Through the use of high-speed broadband via NG911, an enhanced 911 system, the public will be enabled to alert emergency personnel to situations by sharing text and photos to emergency dispatch. This in turn gives first responders a better understanding of an emergency situation prior to arrival.

FirstNet: The upcoming nationwide first response system, known as FirstNet, will rely on high-speed broadband accessibility. First responders will require a reliable, resilient, dedicated public safety broadband network to perform their life saving mission. This

exclusive network will enable public safety to communicate data without interruption, which isn't possible using commercial networks. Broadband will enable a faster, more coordinated response to incidents while providing emergency personnel with the necessary information to properly respond to situations with a greater knowledge of the scene they will encounter.

"We live in a mobile world. Everything is mobile, everyone is on their devices. FirstNet was designed because the commercial networks are becoming busier and busier and we need the network, and a reliable network, to use because when an emergency happens everyone is on their devices and the networks tend to get overloaded," said DPS Sargent Thomas Lampe.

HEALTHCARE

Iowa supports and continues to develop e-health initiatives allowing hospitals and clinics throughout the state access to broadband to facilitate the ability to administer healthcare services statewide. The ICN is a key provider of telemedicine services in Iowa, providing critical healthcare information to and from many locations around the state through its partnership in the Iowa Rural Health Telecommunications Program. Broadband assures all Iowans have access to the care they require no matter their location.

Patients in rural areas of the state rely on broadband as they are provided access to specialists and services that are typically available only in more urban areas. This is especially true for those patients using eICU services. With eICU primary care physicians/nurses can discuss the plan of care with a specialist's monitoring team and develop the best continuum of care for the patient.

Daren Relph, Wayne County Hospital CEO in Corydon, Iowa, explains, "The eICU project allows us to take care of patients closer to their home more than we had previously been able to. Patients that once upon a time would have been transferred to a different facility, we are now able to monitor in our local facility with the same expertise".

GOVERNMENT

Government services require broadband access to serve constituents in real time with activities such as: benefits programs, facilitating travel and commerce, regulatory oversight, hunting licensing and citizen tax services. With ICN's secure broadband connections, state government gathers, processes, stores, and provides authorized access to extensive amounts of information. Giving access to these services increases efficiencies and creates a cost effective way of doing business.

Broadband access permits government information to be managed and minimizes the risk of exposure either inadvertently through loss from cyber-attacks, or to insiders who betray the public trust. The ICN, as a closed, dedicated network, is intrinsically more secure than commercial networks.

"We're in the position right now trying to deliver every piece of information, every public record the government has to citizens and broadband access facilitates that," explained Robert Von Wolffradt, Chief Information Officer, State of Iowa.

Iowans now depend on broadband for even the most basic transactions. For example; when they need to renew their driver's licenses online or at their county court house/driver's license station. If Iowans renew their license online the electronic information is received by the DOT via the ICN's fiber optic Network. If Iowans visit a local driver's license station in person their information is recorded and processed by DOT staff electronically using broadband.

ECONOMIC DEVELOPMENT

High speed broadband access is an essential component to Iowa as a global leader in business, education and quality of life. Every goal, every initiative Iowa's leaders embark on has one common requirement - that every Iowan in every part of the state has access to reliable and affordable high speed broadband Internet. It is the defining tool for ensuring a prosperous economy for generations to come.

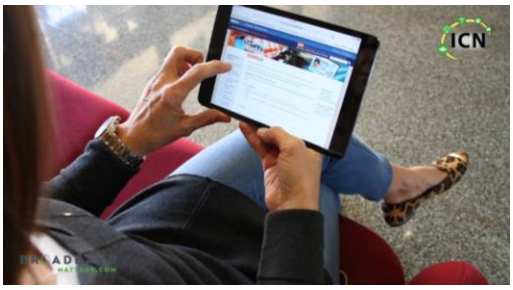
"Everything about our economic development agenda is basically how do you connect with that broader world. When you consider 95 percent of our customers live outside of the United States then you have to really say, we're going to grow our businesses small and large…we have to be open to how we navigate that. The best way to do that is to communicate with them in a real time basis. So that's why connectivity is so important. It brings that big world and it brings it to Iowa," stated Debi Durham Director of Iowa Economic Development Authority.

VIDEOS

For additional information about how high-speed broadband access is impacting the lives of Iowans throughout the state please take a moment to watch these short testimonial videos.

Watch how rural school districts are utilizing broadband access as a tool for 21st century learning opportunities.

Watch how public safety utilizes broadband to respond faster to emergency situations. Learn about the future of FirstNet.



Watch how connectivity is discussed when a community is trying to attract the next big data center or company. Learn how broadband access brings the global economy closer to Iowa.

Watch how rural healthcare providers utilize broadband to deliver emergency care to patients. Learn how the future of broadband will impact the delivery of care for those in rural communities.

Watch how government services are utilizing broadband to provide more efficient services to users throughout the State. Learn how broadband access will streamline government and save state taxpayers millions.

DATA

Broadband Access

Broadband availability data from Connect Iowa indicates that over 98% of Iowa households can access broadband at the most basic speed (768 Kbps [Kilobits per second] download/200 Kbps upload). Statewide availability begins to decrease at the speed of 6 Mbps download/1.5 Mbps upload (with only 82% of Iowans able to access broadband at these speeds). Only 72% of Iowans can access broadband at speeds of 50Mbps or greater.[2]

Table 1 – Estimate of Broadband Service Availability in the State of Iowa – By Speed Tier Among Fixed Platforms

SBI Download/Upload Speed Tiers	Unserved Households ('000)	Served Households ('000)	Percentage of Served Households by Speed Tier
At Least 768 Kbps/200 Kbps	20	1,202	98.38
At Least 1.5 Mbps/200 Kbps	42	1,180	96.59
At Least 3 Mbps/768 Kbps	73	1,148	93.99
At Least 6 Mbps/1.5 Mbps	215	1,006	82.37
At Least 10 Mbps/1.5 Mbps	237	985	80.62
At Least 25 Mbps/1.5 Mbps	308	913	74.76
At Least 50 Mbps/1.5 Mbps	333	889	72.74
At Least 100 Mbps/1.5 Mbps	388	834	68.27
At Least 1 Gbps/1.5 Mbps	1,187	35	2.86

Source: *Connect Iowa, November 2014.*

[2] Broadband availability data collected as part of November 2013 Iowa broadband dataset by Connect Iowa. http://www.connectiowa.org/sites/default/files/facts-figures/files/ia_nov_2014_table_1.pdf

Connect Iowa's 2013 residential adoption research tells us that only 76% of Iowa households have adopted broadband. Further data shows broadband adoption rates among at-risk demographic groups like low-income households (adoption rate = 51%), rural households (adoption rate = 70%), or African-American households (adoption rate = 66%).[3]

Trends in Technology Adoption and Barriers to Adoption

	Iowa	
HOME BROADBAND ADOPTION RATES	**2012**	**2013**
Statewide	71%	76%
Among African Americans	56%	66%
Among Hispanics	67%	59%
Among Rural Residents	66%	70%
Among Low-Income Households	46%	51%
Among Households with Children	83%	85%
Among Adults Age 65 and Older	44%	54%
MOBILE BROADBAND USAGE RATES	**2012**	**2013**
Statewide	47%	53%
Among African Americans	46%	41%
Among Hispanics	41%	73%
Among Rural Residents	40%	46%
Among Low-Income Households	33%	32%
Among Households with Children	66%	69%
Among Adults Age 65 and Older	16%	18%
BARRIERS TO HOME BROADBAND ADOPTION	**2012**	**2013**
Belief that Broadband is not Relevant	29%	31%
Cost	21%	16%
Lack of Digital Literacy Skills	17%	17%
Broadband is not Available	5%	6%

[3] 2013 Connect Nation Trends in Technology Adoption and Barriers to Adoption.

Since Iowa businesses require broadband connectivity for economic development, it is also important to reflect that the 2014 Connect Iowa data shows that 16,000 Iowa businesses currently don't use broadband service.[4]

2014 Connected Nation Business Technology Assessment

	US	IOWA
Businesses without broadband	1,486,000	16,000
Businesses that allow employees to telework	34%	27%
Small businesses that allow employees to telework*	33%	27%
Broadband-connected businesses that subscribe via the following platforms		
Cable modem	36%	28%
DSL	32%	38%
3G or 4G wireless service through a cellular phone network	26%	25%
Dedicated services (T1 or T3)	11%	6%
Fixed wireless	10%	9%
Fiber	13%	19%
Satellite	6%	4%
Businesses that report that it is "Difficult" or "Very Difficult" to find employees with the necessary training	21%	19%
Percent of businesses that earn revenues from online sales	39%	36%
Estimated total annual revenues from online sales	$2.3 Trillion	$20 Billion
Technology Adoption among All Businesses		
Use broadband at the workplace	80%	81%
Use mobile broadband	46%	46%
Have a website	63%	61%

TechNet, a national non-profit technology advocacy organization, compiled in 2012 its latest State Broadband Index, which ranked states according to broadband adoption (using 2011 National Telecommunications and Information Administration data), network speeds (using peak and average network speed data from Akamai and data on the percent of households passed by fiber optic broadband infrastructure via the Fiber to the Home Council), and "economic structure," which measures the percentage of jobs in each state that could be considered "as information and communications technology industries," and research that led to an estimate of applications development jobs in each state. Currently Iowa ranks 11th out of 12 Midwestern states on the TechNet State Broadband Index, behind neighboring states Nebraska, Minnesota, Missouri, and Illinois.[5]

[4] 2014 Connected Nation Business Technology Assessment

[5] December 2013 Initial Action Recommendations, Iowa Science, Technology, Education, Engineering, & Mathematics Advisory Council Broadband Committee

SUMMARY

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Broadband Matters: In an effort to educate all Iowans on the importance and need to provide high-speed broadband access to all parts of the state, the Iowa Communications Network has launched the campaign 'Broadband Matters'. Many Iowans still do not understand or embrace how broadband impacts their lives and their communities. This campaign will bring the conversation to the foreground and affirm the continued need for public and private partnerships to ensure Iowa is well positioned in the 21st century global marketplace.

About ICN: The Iowa Communications Network administers the statewide fiber optic network, committed to continued enhancement of distance learning and providing Iowans with convenient equal access to education, healthcare, and government. The Network provides high-speed Internet, data, IP video, and voice services. The ICN transport network is 100% fiber, which is the leading technology for telecommunications networks everywhere in the world. Recent enhancements increased bandwidth to all 99 counties with a 10 GB capable backbone. The ICN can currently operate at 100 GB, and has an upgrade path of up to 400 GB for future growth, a level of capacity far beyond what is currently available from any other network in the state. The Network can meet the needs of its users today, and is positioned to meet their future needs.

THANK YOU.
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